REMARKS

Applicant respectfully requests reconsideration of this application as amended. Claims 1, 10, 25 have been amended. Claims 6, 9, 11, 16, 19-21 and 24 have been cancelled without prejudice. No new claims have been added. Therefore, claims 1-5, 7-8, 10, 12-15, 17-18, 22-23 and 25-29 are presented for examination.

35 U.S.C. § 103 Rejection

Claims 1-4, 10-14 and 25-28 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Wolford, U.S. Patent No. 6,185,692 ("Wolford") in view of Lee et al., U.S. Patent No. 5,815,734 ("Lee") and further in view of Culbert, et al., U.S. Patent No. 6,820,209 ("Culbert").

Claim 1, as amended, recites:

> An apparatus comprising:
> a variable speed bus, the variable speed bus initialized with a first clock frequency;
> a first unit coupled to the variable speed bus, the first unit having a first rate of requests to access the variable speed bus;
> a second unit coupled to the variable speed bus, the second unit having a second rate of requests to access the variable speed bus; and
> an arbitration and bus clock control unit to monitor the first access request rate from the first unit and the second access request from the second unit, and to determine a second clock frequency for the variable speed bus based on the first access rate or the second access request rate, the arbitration and bus clock control unit being modified to track a rate of request of the first and second units to access the variable speed bus, the arbitration and bus clock control unit being further modified to recognize when there are no incoming requests and a percentage of arbitration slots that are being used, and to instruct a clock throttling logic to adjust a clock frequency associated with the variable speed bus according to bandwidth requirements of the first and second units based on the rate of request, wherein the adjusting of the clock frequency includes lowering the clock frequency to a lowest level necessary in accordance with the recognition of no incoming requests and the percentage of the arbitration slots being used and further in accordance with a historical average utilization including statistical data relating to sustained bandwidth needs such that the clock frequency of the variable speed bus is automatically adjusted

depending on one or more of the rate of request, the percentage of arbitration slots being used, and the historical average utilization relating to the first and second units.

(emphasis added).

Wolford discloses a "*data processing system includes a bus, one or more loads coupled to the bus, and a clock generator. The clock generator generates a bus clock signal that is coupled to at least one of the loads.* While the clock generator is generating a bus clock signal having a first frequency, the number of loads connected to the bus is determined. In response to this determination, the frequency of the bus clock signal is automatically changed from the first frequency to a second frequency." (Abstract; emphasis added; see also Fig. 1, col. 3, lines 6-19, 37-42; col. 4, lines 6-12, 34-41, 62-66).

The Examiner acknowledges that Wolford does not teach all the limitations of claim 1, but relies on Lee and Culbert to make up for the deficiencies of Wolford. Applicant respectfully disagrees with the Examiner's characterization of the cited references and the pending claims. For example, Lee discloses "facilitating operation of a peripheral bus, such as a PCI bus, at a higher clock frequency . . . If the system determines that the clock frequency will change due to a change in the system configuration (such as PCI devices being added or removed from the PCI bus), the configuration registers of each of the PCI devices can be modified to insure proper operation at the new clock frequency." (Abstract).

Referring now to a section relied upon by the Examiner in a previous Office Action (mailed, June 13, 2008), Lee discloses "[i]t should be understood, however, that more or less peripheral devices may be used, as desired and as permitted by the system specifications. Each of the peripheral devices 70, 80 preferably includes a status register 57, constructed and configured similarly to the status register of the BIU 50. In addition,

each of the peripheral devices 70, 80 connects to the PCI bus 100 and to the CLK and 66 MHzENABLE lines, respectively . . . The clock driver 55 connects to the 66 MHzENABLE line to check the status of that line. If the 66 MHzENABLE line is asserted (i.e., pulled high), then the clock driver 55 drives the PCI bus clock signal at a frequency up to 66 MHz. Conversely, if the 66 MHzENABLE line is deasserted (i.e., drive low), the clock driver 55 drives the PCI bus clock signal at a frequency up to 33 MHz. Thus, in the preferred embodiment, the speed at which the PCI bus clock signal is driven by clock driver 55 is dependent on the status of the 66 MHzENABLE line." (col. 5, lines 31-59).

Referring now to the section of Culbert relied upon by the Examiner (see in a previous Office Action (mailed, June 13, 2008), Culbert discloses "***the arbitration unit 208 determines which of the resources, besides the display interface 210, needs access to the local memory 202***. When less than all of these resources need access to the local memory 202, the local memory interface 204, the local memory 202 and the memory bus 206 can be operated at a reduced speed because the amount of bandwidth required with respect to the local memory 202 is reduced." (col. 6, lines 44-51). Culbert's ***arbitration unit to determine which resource, besides the display device, need access to the local memory*** is **not the same** as having an arbitration and bus clock control unit to monitor the first access request rate from the first unit and the second access request from the second unit . . . to determine a second clock frequency for the variable speed bus based on the first access rate or the second access request rate . . . to track a rate of request of the first and second units to access the variable speed bus as recited by claim 1.

For the sake of expediting issuance of this case, Applicant proposes additional amendments to claim 1. Claim 1 further recites "in accordance with the recognition of no incoming requests and the percentage of the arbitration slots being used and further in

accordance with a historical average utilization including statistical data relating to sustained bandwidth needs such that the clock frequency of the variable speed bus is automatically adjusted depending on one or more of the rate of request, the percentage of arbitration slots being used, and the historical average utilization relating to the first and second units". (emphasis added). There is not teaching or reasonable suggestion of "historical average utilization" in Culbert or any of the other cited references. Culbert discloses *the local memory and the memory bus can be operated at a reduced speed because the* ***amount of bandwidth required with respect to the local memory is reduced***. In other words, Culbert relies on *whether the amount of bandwidth required* ***is reduced*** (see col. 6, lines 48-51) which is ***contrary to*** using the "historical average utilization" limitation of claim 1 (emphasis added). Further Culbert does not teach or reasonably suggest using one or more of the rate of request, the percentage of arbitration slots being used, and the historical average utilization relating to the first and second units to automatically adjust the clock frequency of the variable speed bus as recited by claim 1. Accordingly, for the reasons set forth above, Applicant respectfully requests the withdrawal of the rejection of claim 1 and its dependent claims.

Claims 10 and 25 contain limitations similar to those of claim 1. Accordingly, for at least the same reasons as set forth above with reference to claim 1, Applicant respectfully requests the withdrawal of the rejection of claims 10 and 25 and their dependent claims.

Claims 22-23 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Wolford, U.S. Patent No. 6,185,692 ("Wolford") in view of Lee et al., U.S. Patent No. 5,815,734 ("Lee) and further in view of Barr, et al., U.S. Patent Publication No. 2005/0044442 ("Barr").

Claims 22 and 23 depend from one of claims 10 and thus include all the limitations of the corresponding base claim. Thus, for at least the same reasons as set forth above with respect to claim 1, Applicant respectfully requests the withdrawal of the rejection of claims 22 and 23.

Claims 5, 7, 8, 15, 17 and 18 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Wolford, U.S. Patent No. 6,185,692 ("Wolford") in view of Lee et al., U.S. Patent No. 5,815,734 ("Lee) and in further view of Culbert, et al., U.S. Patent No. 6,820,209 ("Culbert"), and further in view of common knowledge in the data processing art at the time of the invention with and without the patent granted Keeley, U.S. Patent No. 5,844,794 ("Keeley").

Claims 5, 7, 8, 15, 17 and 18 depend from one of claims 1 and 10 and thus include all the limitations of the corresponding base claim. Thus, for at least the same reasons as set forth above with respect to claim 1, Applicant respectfully requests the withdrawal of the rejection of claims 5, 7, 8, 15, 17 and 18.

Conclusion

In light of the foregoing, reconsideration and allowance of the claims is hereby earnestly requested.

Invitation for a Telephone Interview

The Examiner is requested to call the undersigned at (303) 740-1980 if there remains any issue with allowance of the case.

Request for an Extension of Time

Applicant respectfully petitions for an extension of time to respond to the outstanding Office Action pursuant to 37 C.F.R. § 1.136(a) should one be necessary. Please charge our Deposit Account No. 02-2666 to cover the necessary fee under 37 C.F.R. § 1.17(a) for such an extension.

Charge our Deposit Account

Please charge any shortage to our Deposit Account No. 02-2666.

Respectfully submitted,

BLAKELY, SOKOLOFF, TAYLOR & ZAFMAN LLP

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